

# ADDITIONAL NOTES ON THE GENUS *VITEX*. XV

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## *VITEX DONIANA* Sweet

Additional bibliography: Mold., Phytologia 44: 386, 389, & 416-417. 1979.

Recent collectors describe this species as a tree, 3 to over 25 m. tall, often single-stemmed, or a middle-sized or very large shrub, often solitary; trunk 30--100 cm. in diameter at breast height; wood soft, light; sap colorless; bark rough; branchlets glabrous; leaves "5-lobed" [*i.e.*, composed of 5 leaflets], very dark-green above, grayish beneath, glabrous; inflorescence "covered with rusty-brown hairs"; flowers in dense axillary cymes, hairy, "on long pedicels [*i.e.*, peduncles] in leaf-axils"; fruit "the size of a cherry", green with lighter patches or white spots when immature, blackish-purple when ripe, edible. The chromosome number is reported by the Mangenots (1962) as  $2n = 32$ . Gossweiler calls the plant a "wet hydrophyte". The corollas are said to have been "white" by Den Outer (1972), "yellowish or white with blue-purple corolla-lobes" by Hutchinson & Dalziel (1936), and "petals dirty-white inside with a blue lip" by Williams (1949). It is said to have been "blue to mauve" on *Reckmans* 1409 and "white, upper petal purple" on *Richards* 25816.

Siwunmi (1973) describes the pollen as follows: "Pollen grains isopolar, radially symmetrical; 3-colpate; lobate-oblate spheroidal ( $P\ 25.7 \pm$ ,  $E\ 25.0 \pm 1.2\ \mu m$ ). Sexine subtectate. NPC: 343. Colpi ca.  $17.6 \pm 1.4\ \mu m$  long, width ca.  $1.4 \pm 0.1\ \mu m$ . Apocolpium diameter  $8.0 \pm 0.1\ \mu m$ . Exine  $2.0\ \mu m$  thick (thinner at the colpi). Sexine reticulate, reticulation finer at apocolpia than at mesocolpia. Muri  $0.4 \pm 0.1\ \mu m$  wide, distinctly simplibaculate. Lumina  $0.7 \pm 0.1\ \mu m$  wide. Tectal part of muri  $0.6 \pm 0.1\ \mu m$ , baculate zone  $0.5 \pm 0.1\ \mu m$ , foot layer  $0.9 \pm 0.1\ \mu m$  thick", based on *Jos* 1965.

Recent collectors have encountered *V. doniana* in dry gulches, on wooded savannas and secondary savannas in mesophyll forests, at the edges of sandy bushland, on riverbanks and lake shores, in the riverine forest belt, in gallery forests and light forests on heavy loam, on shrubby savannas, in hard stony soil in open parklands, and in gullies in *Brachystegia* woodlands, at 700--1900 m. altitude, flowering in January and February and from April to November, fruiting from January to April and in August. Greenway (1973) describes it as dominant in mixed but mainly compound-leaved *Brachystegia microphylla* wood on hillsides. Kershaw (1967) says that in Nigeria, according to Keay (1948), this species grows in open woodlands with *Lophira alata*, *Terminalia glaucescens*, *Daniella oliveri*, *Hymenocardia acida*, *Detarium senegalense*, and *Azelia africana* as the characteristic species of trees. He also

lists it as found in the *Isoberlinia-Parinari* and *Monotes-Parinari* associations, as well as in the fringing woodlands with *Pterocarpus erinaceus*, more characteristic of the southern Guinea zone in Nigeria, but widespread in the northern zone where it is valued by the natives for its edible fruit. Irvine (1970) asserts that it occurs in the grass savannas as well as in deciduous and secondary forests in Ghana, thriving especially in very dry and gravelly soil. Lawton (1978) tells us that it is a member of the "chipya ecological group of species growing in an open habitat where dry season fires are intense."

Hutchinson & Dalziel (1936), including *V. divaricata* Baker in the synonymy, record *V. doniana* from savanna forests and open country from "Senegal to N. Nigeria and Lagos Colony! Also in Fernando ro: Extends to E. Sudan, Upper Nile Land, and E. Africa; also Congo Basin and Angola." Crowfoot (1928) records it from northern and central Sudan, Gillett (1970) from Kenya, Paradis & Hougnon (1977) from Dahomey, Gürke (1895) from the Comoro Islands, Amico (1967) from Zambezia in Mozambique, Bouquet (1967) from the Republic of Congo, and Astle (1968) from Zambia. Drar (1970) records it from Bahr El Ghazar, Sudan, citing his nos. 1069 & 1607; Gameel (1971) also lists it from Sudan. Chapman (1962) refers to it as "widespread, common" in Nyasaland. Rein (1911) says that it "Kommt in den südlichen Gegenden des weissen und blauen Nils und am Sobat vor, ein grosser Baum mit fünfteiligen Blättern, weissen, sehr leichten Holz." Hyland (1969) lists it as cultivated in Maryland, based on U. S. Dept. Agr. Pl. Invent. 307744 from Nigeria. Sweet (1826) and Loudon (1832) report it introduced into cultivation in England from Sierra Leone in 1824.

It is worth noting that Täckholm & Elsayed 86 and s.n. [23/6/1961] and s.n. [22/11/1961] have extraordinarily long petiolules, while Staner 1405 exhibits leaflets that are apically very much acuminate-pointed. Gossweiler 9168 has insect-galled leaves.

Begemann (1969) describes the tree and its wood as follows: "Ein sehr grosser Baum mit breit-ausladender Krone, der Höhen über 25 m und Durchmesser zwischen 40 und 100 c/m erreicht. Der Schaft hat hohe Wurzelanläufe und ist nur selten gerade und zylindrisch gewachsen. -- Die Rinde ist sehr dünn bis dünn und hellbraun bis gelblich-grau. -- Splint und Kernholz gehen in einander über und sind nur schwach zu unterscheiden. Der Split ist etwa 4 bis 6 c/m breit und gelblich-grau, wogegen das Kernholz im frischen Zustande cremefarben ist, später auf hellbraun übergehend. Jahresringe sind mit blossen Auge kaum zu erkennen. Das Holz hat häufig Silikat-Einlagen und keinen besonderen Geschmack oder Geruch. Die Struktur ist durchweg drehwüchsig, die Textur ziemlich grob und ungleichmässig. Das Holz schwindet stark und gilt als bedingt dauerhaft, wenn es nicht ständig dem Wechset zwischen Feuchtigkeit und Trockenheit ausgesetzt wird. Es ist mittelschwer, hart, fest und nur sehr wenig elastisch. Die Trocknung bedarf grosser Sorgfalt, da eine starke Tendenz zum Reissen und Werfen besteht. Im trockenen Zustande ist das Standvermögen im allgemeinen gut. Durch den Kristallgehalt des Holzes ist die Bearbeitung erschwert und erfordert einen grösseren Kraftaufwand. Werkzeuge stumpfen schnell. --

Trotzdem lässt sich das Holz maschinell und von Hand gut bearbeiten. Gehobelte Flächen werden durch den Drehwuchs erst mit Nachbearbeitung glatt und haben matten Glanz. Die Oberflächenbehandlung bereitet keine Schwierigkeiten. Es empfiehlt sich, Schrauben und Nägel zur Vermeidung von Rissbildung vorzubohren. Holzverbindungen mit Leim oder Zapfen sind leicht herzustellen und haltbar. Auch schäl- und messerfähig. -- Spezifischen Gewicht um - .52 bei 15% Feuchtigkeitsgehalt. Verwendung: Für Aussenzwecke, wie auch als Bau- und Konstruktionsholz wenig zu empfehlen; gut geeignet für Bau- und Möbelschreinerei, als Kisten- und Bindholz, Mittellagen, für die Sperrholz-Industrie u.ä. -- Das Holz fällt inwendig nicht sehr astrein aus. Handel: Trotz ausreichendem Vorkommen in den Wuchsgebieten, hat das Holz bisher im Import noch keine Bedeutung erlangt."

Jaeger & Moldenke (1975) refer to *V. doniana* as "Le plus grand des *Vitex* de l'Afrique Occidentale", growing to 25 m. tall, and found "du Sénégal au Cameroun; très répandé en Afrique tropicale de préférence en savane et en terrain découvert".

Among the common and vernacular names applied to this tree, its fruit, and/or its wood as reported by recent collectors and authors are the following: "abisoa", "abis(wa)", "ada", "adaga", "afetewa", "afua", "akposso", "anago", "anecho", "aranga", "black plum", "boume", "bugink", "bulgelwa", "chinkamba", "dagomba", "dinya", "Don's chaste-tree", "dunya", "dyakossi", "edi", "ekarukei", "ewe", "fo", "fö", "fojiti", "föjiti", "fongjiti", "gídjikö", "heinkohun", "ingari", "kalembe", "kazonga", "Kenya oak", "koro", "koro ba", "koto", "koto", "kratschi", "kukpweli", "kurain", "kurnyuk", "ledo", "lubai", "meru", "meru oak", "mfifya", "mfudu", "mfuru", "mfurulegea", "mfuru ya mtoni", "mfuu", "mgwobe", "mkhulu", "mkunungu", "mpulu", "mpuro", "m'purro", "mufudu", "mufufu", "mufuru", "mufutu", "muholu", "muhomozi", "mukarukei", "munyamazi", "mutahuru", "muviru", "muvuru", "narenga", "npindimbi", "nrindimbi", "nya", "nyarina", "odogo", "ofön", "omufutu", "omuvyero", "ori", "orli", "oyelo", "panyerö", "samanibir", "sö", "sod", "sokoro", "tschaidjo", "uoli", "yuelo", and "zeitun".

Volkens (1909) speaks of the inflorescences as white and comments that "Aus den schwarzen, glatten, essbaren, kugligen Früchten und den jungen Blättern wird Tinte gekocht", the species inhabiting "Galleriewäldern, Baumsteppen und auf Farmen" and being "weit verbreitet. Das weisse, mittelschwere Holz dürfte sich besonders für Möbel gut eignen. In Oberguinea werden Schiffsplanken und Furniere daraus gemacht, die Eingeborenen benutzen es für Bootsruppen". Burkill (1966) says that the fruits are "said to be used as a substitute for tea and coffee in tropical Africa". This is also claimed by Rein (1911).

Irvine (1961) provides the longest discussion of the economic uses of this species, saying that "The flowers and fruits attract bees; hives are often put in the branches. It is specially planted in N. T., the leaves being used for stock....Also planted in villages [in]...N. Nigeria....for the edible fruits and young leaves, used as a pot herb. A sweetmeat (Hausa alewa) made from these and other fruits, and a black molasses or beverage (e.g. tea substitute in Sudan) can be prepared from them. Ink also made from young

leaves or fruit or sometimes bark, gum added. Bark and roots used to prepare a cloth dye (for *Adink(a)ra* cloths) are cut up, boiled with iron slag as mordant; poured into another pot, and boiled till thick; egg or sugar then added. The bark is a substitute for soap in S. Leone.....The fruit-pulp is said to contain oil..... The timber is whitish to light brown, darkening later; it rather resembles teak and is of medium weight and straight grain, nails well, and is said to be durable. It is used in housebuilding, furniture, boxes, crates, bowls, stools, shelves, and in Uganda for knife-handles, chairs, and trumpets. A favourite wood for making log beehives. It is useful for firewood; and the ashes for soap-making (S. Leone....).....dried leaves...medicinal...A decoction of pounded roots is used in Fr. Guinea for stomach troubles.. A decoction of the root-bark is recommended as a drink or for baths and is used on the Iv. Coast for children with rickets..... The bark is used in various Iv. Coast remedies for leprosy and sterility. A bark decoction is used as a gargle....The bark is used in W. Ashanti for stomach complaints. The bark and leaves are sometimes given for diarrhoea and dysentery....The leaves are used by the Moshi on the Iv. Coast to keep crocodiles from water holes. A leaf decoction is drunk, or used as an enema for dysenteric diarrhoea.....A leaf infusion is given for colds in Guinea.....The pounded leaves are applied to the body as a febrifuge.....The tender leaves are chewed, or an infusion of leaves and bark are used medicinally in Ghana. The fruits are used in N. Nigeria for constipation....and are sometimes given for diarrhoea and dysentery. In S. Leone they are considered good for conditions due to A and B avitaminosis, associated with sores at the corners of the mouth and eyes, and sometimes in advanced cases, with paralytic symptoms.....*Loranthus* growing on this tree is used in N. Nigeria for leprosy.....In Katanga (B. Congo) the tree is said to be used to induce conception...."

Dale & Greenway (1961) aver that the edible fruit is "sweet, mealy, somewhat resembling a prune in taste. Wood white or yellow-white to pale brown, darkening in age, even and straight in grain, fine and uniform in texture, soft, moderately durable, easy to work with tools; it smooths reasonably but does not take a polish, nails satisfactorily and does not split, tenons, mortises, recesses and moulds well; weight about 53 lb. per cu. ft. air dry. The timber has some resemblance to teak, and is used locally in West Africa for boat timbers (ribs, etc.), for small canoes, house-building and so on. It is suitable for uses to which poplars and deals are put, for interior fitting boxes, crates, shelving, low-grade furniture, etc. It must not be exposed to damp, and is not suitable for purposes calling for great strength." Irvine (193) reports that in Gold Coast the species is used for firewood, dye, ink, and the edibility of its fruit. Williams (1949) found the fruit being eaten by children in Zanzibar and the wood employed there for laths, roof-building, planks, canoe-outriggers, and guitars. Thomas (1972) records its use in treating yellow fever. Altschul (1973), Alain (1974), Gürke (1895), and Watter & Breyer-Brandwijk (1962) all comment



on the edibility of the fruit. Tanner reports the species used in Tanzania to treat cases of prolonged labor during childbirth. Sabine (1824) comments that although the fruit is edible, it is inferior in quality to that of both the yellow and sugar plums of tropical Africa. Schweinfurth (1874) reports that the "sweet, olive-shaped fruit is relished exceedingly by natives of central Africa". Uphof (1968) repeats that the fruit is the size of an olive and much esteemed. "A gum is used for compounding Mallam's ink; also considered an antidote for arrow poison. Leaves used as a substitute for tea in Trop. Afr." Watt & Breyer-Brandwijk (1962) claim that in Zambia *V. doniana* is used as a remedy for anemia and the root for gonorrhoea. Rein (1911) says that "Die harten Früchte werden geröstet und aufgekocht als Ersatz für Tee und Kaffee genossen". Irvine (1930) reports the fruit sold in native markets in Ghana.

Hansford (1961) reports *V. doniana* as a host for the fungus, *Meliola cookeana* var. *viticis* (Hansf.) Hansf. in Uganda, based on the type collection of the fungus, Hansford 799, and *M. cookeana* Speg. in Sierra Leone, based on Deighton 564, 987, 1551, & 1766. Cohic (1969) found it to be host to the insects, *Aleurotuberculatus nigeriae* Mound, *A. gambiae* Gameel, and *Bemisia hancocki* Corbett. Roberts (1969) reports it as host to the larvae of the lepidopteron, *Bunaea alcinoë* (Stoll) and the beetle, *Premnobius cavipennis* Eichhoff in Nigeria.

Baker (1900) separates his various taxa, now regarded by most authors as being conspecific, as follows:

1. Leaves usually 3-foliolate.....*V. doniana*.  
1a. Leaves usually 5-foliolate.

2. Leaflets not coriaceous.....*V. dewevrei*.  
2a. Leaflets coriaceous.

3. Corolla-tube as long as the calyx.....*V. cuneata*.

3a. Corolla-tube longer than the calyx.....*V. cienkowskii*.  
As being typical of *V. doniana* he cites Heudelot 379 from Senegal. As typical of *V. dewevrei* he cites Dewevre s.n. from Lower Congo; of *C. cuneata* he lists Thonning s.n. from Upper Guinea, and as typical of *V. cienkowskii* he cites Barter 1108, Millen 118, Rowland s.n., Scott Elliot 5211, and Vogel 67 from Upper Guinea, Cienkowsky s.n., Heughlin s.n., Schweinfurth 1307 & 1890, Scott Elliott 7179, and Speke & Grant 81 from Nile Land, Smith s.n. from Congo, Welwitsch 5633, 5645, & 5746 from Angola, Kirk 1 from Zanzibar, Hildebrandt 1123 from Tanganyika, Kirk 40 from Mozambique, and Buchanan 80, Kirk s.n., Meller 5, and Scott s.n. from Nyasaland.

Good & Exell (1930) cite their nos. 5376 & 5376a from Angola and 6305, 7851, 8652, & 9168 from Portuguese Congo, asserting that the tree grows in wet situations and on riversides, often in company with *Canthium schimperianum*. They note that it is "Widespread in Tropical Africa". Palhinha (1947), speaking of an unidentified species of *Vitex* in Portuguese Congo, says that "Esta planta parece-me bastante próxima, se não idêntida, a *Vitex cuneata* Sch. et Thonn., e igualmente afim da *Vitex Cienkowski* Kotschy et Peyr., da qual difere pelas folhas maiores e inflorescências um pouco menores e mais fracas."

Roberty (1954) refers to *V. doniana* as "forme la plus commune" in West Africa "surtout près des rivières ou marais. Très variable, 4 formes principales" -- after which he lists, apparently as "forms", *V. barbata* Planch., *V. chrysocarpa* Planch., "*V. doniana* s.s.", and *V. grandifolia* Gürke, but I regard these as four separate and distinct species. To include them all under *Vitex doniana* would most certainly render that taxon "très variable"!

Dale & Greenway (1961) cite Dale 3115, Graham 25 & 2226, and Napier 5329 from Kenya. Hutchinson & Dalziel (1936) cite Berter 1108, Chevalier 2769, Chipp 463, 727, & 744, Dalziel 350, Heudelot 379, Lely P.134, Millen 118, Milne s.n., Pobéguin 682, Rowland s.n., Scott Elliot 5211, Warnecke 156, and Yates 59. Lewalle (1972) cites his no. 608; Astle (1968) cites his no. 2718 from Zambia; Amico & Bavazzano (1968) cite their no. 455; Cufodontis (1962) cites Kuls 256, 281, & 473. DeWildeman (1914) cites *Homblié* 318 as the type of his *V. homblei*; Irvine (1930) cites Irvine 151 & 194 from Ghana. The *Don* s.n. from Sierra Leone and Heudelot s.n. from Senegambia cited by Hooker & Benthham (1849) are most certainly *V. doniana*,

Material of *V. doniana* has sometimes been misidentified and distributed in some herbaria as *V. madiensis* Oliv. On the other hand, the Angil 2774, Lewalle 2200, Lowe 2049, Reekmans 2702, Richards 25816, Tanner R.T.1758, 4272, & 4488, and Vigne 3541, all distributed as typical *V. doniana*, are regarded by me as representing var. *parvifolia* (Engl.) Mold., while Drar & Mahdi 1607 is not verbenaceous.

Additional citations: SIERRA LEONE: *G. Don* s.n. [Mo. Bot. Gard. photo A.851] (N--photo of type, W--photo of type); Gledhill DH.577 (Mu); Jaeger 1401 (Ac), 1756 (Ac), 9258 (Id). LIBERIA: J. T. Baldwin 10989 (W--2672784, W--2672785). TOGO: Warnecke 156 (Mu--3857). NIGERIA: Blum 2502 (Ws). ZAIRE: Gerard 2504 (Mu); Louis 12487 (N), 12562 (W--2091094); W. Robyns 1144 (W--1942516); Staner 1405 (W--2091224); Taton 7395 (Mu). BURUNDI: Reekmans 1409 (E--2209171), 1414 (E--2209177). UGANDA: Bagshawe 813 (W--1505799). TANZANIA: Tanga: Tanner 4804 (Ba). ANGOLA: Kongo: Gossweiler 9168 (W--1373601). Lunda: Gossweiler 14109 (W--2074458). ZAMBIA: Evrard 3951 (Mu); E. A. Robinson 3938 (Mu). MALAWI: Brass 17074 (W--2061955); J. Buchanan 194 (W--806717). CULTIVATED: Egypt: Drar s.n. [12/1/1960] (Gz); Täckholm & Elsayed 86 (Gz, Gz), s.n. [23/6/1961] (Gz, Gz), s.n. [14/11/1961] (Gz), s.n. [22/11/1961] (Gz, Gz); Täckholm & Mahdi s.n. [17/5/1967] (Gz, Gz).

*VITEX DONIANA* var. *PARVIFOLIA* (Engl.) Mold.

Additional bibliography: Mold., *Phytologia* 15: 107--108. 1967; Mold., *Fifth Summ.* 1: 224, 231, 234, 247, & 252 (1971) and 2: 715, 716, 924, & 968. 1971; Mold., *Phytologia* 28: 442 & 452 (1974) and 44: 386. 1979.

Recent collectors describe this plant as a "small shrub" or as a small or large spreading tree, 5--20 m. tall, much branched, with a thick bole and dense rounded crown, giving thick cover, the stem single, upright, the bark gray, rough, lined or corrugated, the sap colorless, the wood white, soft to cut, with a

brown "slip", the leaflets 5, coriaceous, dark or glossy bright-green, the flowers aromatic, the calyx with pale-brown indumentum, and the fruit (immature?) pale-green. They have found it growing near lakes, in "abercorn" gardens, in light forests on sandy loam soil, in open parkland on hard stony soil, in light forests on hillsides with gravel and loam soil, and "in deep shade in well-grown *Brachystegia* woodland with luxuriant rich undergrowth containing evergreen shrubs", at 500--2165 m. altitude, flowering in September and November, fruiting in February, March, May, and November. Watmough speaks of it as "occasional" in Zambia.

The corollas are said to have been "mauve" on Tanner R.T.1758, "violet" on Reekmans 2702, "pale yellow-mauve" on Richards 21451, "white to pale-mauve" on Lewalle 2200, and "white, upper petal purple" on Richards 25816.

According to Tanner the bark of this tree is used in the treatment of leprosy in Tanzania. Material has been misidentified and distributed in some herbaria as typical *V. doniana* Sweet, *V. amboniensis* Gürke, and *V. madiensis* Oliv.

Additional citations: SUDAN: Blue Nile: Kassas, Mobarak, Fadlallah, Omar, & Osman E.1035 (Gz, Gz). Bahr El Ghazal: Drar & Mahdi 1069 (Gz). GHANA: Vigne 3541 (N). NIGERIA: Lowe 2049 (N). BURUNDI: Lewalle 2200 (W--2595398); Reekmans 2702 (E--2200855). TANZANIA: Tanga: Richards 25816 (Mu, N); Schlieben 1282 (Mu); Tanner R.T.1758 (Ba, Ca--183319, N), 4272 (Ba), 4488 (Ba). ZAMBIA: Angils 2774 (N); Richards 21451 (E--1836522); Richardson & Livingstone s.n. [30 October 1960] (Au--220301); Watmough 209 (Mu). CULTIVATED: Sudan: Drar & Mahdi 138 (Gz).

#### *VITEX DRYADUM* S. Moore

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 39 (2): 320. 1913; Mold., Phytologia 15: 241--242. 1967; Mold., Fifth Summ. 1: 252 (1971) and 2: 924. 1971.

The type of this species, *Swynnerton* 1062, from Gazaland, Mozambique, in the British Museum herbarium has been photographed by the Missouri Botanical Garden as their type photograph number A. 854. It is possible that *V. oxycuspis* var. *mossambicensis* Mold. may belong here.

Additional citations: MOZAMBIQUE: Gazaland: *Swynnerton* 1062 [Mo. Bot. Gard. photo A.854] (Gz--photo of type, N--photo of type).

#### *VITEX DUBOISII* Mold.

Additional bibliography: Mold., Phytologia 15: 212. 1967; Mold., Fifth Summ. 1: 231 (1971) and 2: 924. 1971.

#### *VITEX DUCKEI* Huber

Synonymy: *Vitex duchei* Huber, in herb.

Additional bibliography: H. N. & A. L. Mold., Pl. Life 2: 57. 1948; Mold., Phytologia 16: 499. 1968; Mold., Fifth Summ. 1: 179 (1971) and 2: 924. 1971.

Recent collectors describe this species as a shrub, 80 cm. tall, and have found it growing in sandy soil of capoeira, flowering in June. The corollas are said to have been "purple and white" on Campbell & al. P.22554. Material has been misidentified and dis-

tributed in some herbaria as "*Bignoniaceae*".

Additional citations: BRAZIL: Amazonas: Prance, Pena, Allen, & Ramos 2706 (S). Pará: Campbell, Ongley, Ramos, Monteiro, & Nelson P.22554 (Ld, N, N); M. Silva 1634 (N).

*VITEX DUCLOUXII* Dop

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 56 (2): 286. 1937; H. N. & A. L. Mold., Pl. Life 2: 57. 1948; Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 290 (1971) and 2: 924. 1971.

*VITEX EBERHARDTII* Dop

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 56 (2): 286. 1937; H. N. & A. L. Mold., Pl. Life 2: 57. 1948; Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 303 (1971) and 2: 924. 1971.

*VITEX ELAKELAKENSIS* Mold.

Additional bibliography: Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 263 (1971) and 2: 924. 1971.

*VITEX ELMERI* Mold., Phytologia 38: 307--308. 1978.

Synonymy: *Vitex elmari* Mold., Biol. Abstr. 65: 6769, sphalm. 1978.

Bibliography: Mold., Biol. Abstr. 65: 6769. 1978; Mold., Phytologia 38: 307--308. 1978; Hocking, Excerpt. Bot. A.33: 86. 1979.

Collectors have found this tree in flower in February.

Material has been misidentified and distributed in some herbaria as the very closely related *Vitex negundo* L.

Citations: PHILIPPINE ISLANDS: Luzon: Elmer 5611 (N--type); E. D. Merrill 3627 (N); Pancho & Apolinario 285 (Au--11005); Rothdauscher s.n. [Manilla, 1879] (Mu--1516, Mu--1517, Z).

*VITEX EPIDICTYODES* Mildbr.

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 57 (2): 402. 1938; Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 232, 238, & 250 (1971) and 2: 716 & 924. 1971; Mold., Phytologia 31: 388. 1975.

Recent collectors refer to this species as a shrub, 3 m. tall, the (immature?) fruit green, and have encountered it on savannas and wooded savannas, at altitudes of 900 to 1200 m., fruiting in December.

Material has been misidentified and distributed in some herbaria as *V. madiensis* ssp. *milanjiensis* (Britt.) White.

Additional citations: BURUNDI: Reekmans 1391 (E--2209172), 2204 (E--2209186).

*VITEX ERIOCLONA* H. J. Lam

Synonymy: *Vitex erioclona* Lam. ex Uphof, Dict. Econ. Pl., ed. 2, 545, sphalm. 1968.

Additional & emended bibliography: H. J. Lam, Bull. Jard. Bot. Buitenz., ser. 3, 3: 48 & 51. 1921; Fedde & Schust., Justs Bot.



Jahresber. 53 (1): 1076. 1932; Uphof, Dict. Econ. Pl., ed. 2, 545. 1968; Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 328 (1971) and 2: 716 & 924. 1971.

Uphof (1968), crediting this species to Lamarck, says of it: "Tree. Indonesia, esp. the Poso region. Wood easy to work, durable; keeps a long time when in contact with the soil; used for making small vessels".

*VITEX EXCELSA* Mold.

Additional bibliography: H. N. & A. L. Mold., Pl. Life 2: 43. 1948; Mold., Phytologia 15: 242. 1967; Mold., Fifth Summ. 1: 179 (1971) and 2: 924. 1971; Mold., Biol. Abstr. 64: 2433. 1977; Mold., Phytologia 35: 277 (1977) and 36: 33. 1977.

*VITEX EXCELSA* var. *PETIOLATA* Mold., Phytologia 35: 277. 1977.

Bibliography: Mold., Biol. Abstr. 64: 2433. 1977; Mold., Phytologia 35: 277 (1977) and 36: 33. 1977.

Collectors describe this plant as a "tree 111.5 feet tall", with a trunk diameter of 36 inches, and have encountered it at 150 m. altitude, flowering in August. The corollas are said to have been "lilac" in color on *Aróstegui V.123*, a collection said to have been taken from the type tree. The immature leaves are strikingly similar to those of *V. panshiniana* Mold. A vernacular name reported is "quinilla colorada".

Citations: PERU: Loreto: *Aróstegui V.75* (N--type, W--2825839--isotype), *V.123* [field no. 104.I] (N, W--2825838).

*VITEX FARAFANGANENSIS* Mold.

Additional bibliography: Mold., Phytologia 15: 242. 1967; Mold., Fifth. Summ. 1: 263 (1971) and 2: 924. 1971.

*VITEX FERRUGINEA* Schum. & Thonn.

Additional synonymy: *Viter fosteri* Aubréville, Ann. Acad. Sci. Colon. 9: 237, sphalm. 1938.

Additional & emended bibliography: Schum. & Thonn. in Schum., Beskr. Guin. Pl. 62. 1827; Hook. f. & Benth. in Hook., Niger Fl. 487. 1849; Buek, Gen. Spec. Syn. Candoll. 3: 501. 1858; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 316 & 324--325. 1900; Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 1, 2: 275 & 276. 1931; Aubréville, Ann. Acad. Sci. Colon. 9: 257. 1938; H. N. & A. L. Mold., Pl. Life 2: 60. 1948; Kerharo & Bouquet, Pl. Méd. Tox. Côte Iv. 234. 1950; Metcalfe & Chalk, Anal. Dicot. 1036, fig. 248 H. 1950; Irvine, Woody Pl. Ghana 762--763. 1961; S. & G. Mangue-not, Rev. Cytol. Biol. Veg. 25: 411--447. 1962; Huber in Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 2, 446--448. 1963; Ornduff, Reg. Veg. 50: 86 & 121. 1967; Mold., Phytologia 16: 499. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl., imp. 1, 717. 1969; Roberts, Commonw. Forest. Inst. Oxf. Paper 44: 38 & 199. 1969; Gadella, Act. Bot. Neerl. 19 (3): 433. 1970; Gillett, Numb. Check-list Trees Kenya 47. 1970; Anon., Biol. Abstr. 52: 89. 1971; Mold., Fifth Summ. 1: 216, 220--223, 232, 234, & 245 (1971) and 2: 717 & 924. 1971; Mold., Phytologia 23: 420 & 437. 1972;

Bolkh., Grif, Matvej., & Zakhar., Chromos. Numb. Flow. Pl., imp. 2, 717. 1974; Kooiman, Act. Bot. Neerl. 24: 462. 1975; Mold., Phytologia 34: 261 (1976) and 44: 408. 1979.

Additional illustrations: Metcalfe & Chalk, Anat. Dicot. 1036, fig. 248 H. 1950.

Recent collectors and authors describe this plant as a tree to 60 feet tall, softly rusty-pubescent, the leaves digitate, the petioles densely rusty-pubescent; leaflets 5--7, sessile, 4 inches long, 2 inches wide; flowers small, borne in cymes, densely pubescent outside; corollas small, pubescent outside; fruits globose, 1/3 inch in diameter. The corollas are said to have been "white" on *Becquaert* 17 and "blue/cream" on *Malima* 19. The species has been found growing on savannas, flowering in July. Irvine (1961) gives its distribution as from the Ivory Coast to Ghana. Kerharo & Bouquet (1950) assert that in the Ivory Coast it enters into a composition used to treat trypanosomiasis, reporting the local names, "kpépésson", "mbolé", and "paintou".

The Manguenots (1962), as well as Bolkhovskikh and his associates (1974), give the chromosome number for the species (as *V. fosteri*) as  $2n = 32$ . Gadella (1970) -- whose surname is misspelled "Gadelia" in the Biological Abstracts reference (1971) -- reports the chromosome number for *V. ferruginea* as  $2n = 32$ , based on Versteegh & Den Outer 562 from Ivory Coast. He also cites seedling material, Van Steenberg 205, both collections deposited in the Wageningen herbarium.

Roberts (1969) reports the following insects as attacking *Vitex ferruginea* in Nigeria: *Doliopygus erichsoni*, *D. interpositus*, *Platypus hintzi*, *P. spinulosus*, and *Pycnatmon cribrata*. Of the last-mentioned he says: "Larvae of this species feed on *Vitex ferruginea*, trees of all ages being attacked. They live singly between two leaves held together with silk. At Ibadan larval development takes at least 16 days and the pupal period from 12 to 17 days. Larvae were found in February, June, September, and November."

It is of interest to note that Hutchinson & Dalziel (1931) kept *V. ferruginea* and *V. fosteri* as separate species [although later combined by Huber (1938)], distinguishing them from each other as follows:

1. Leaves tomentose or densely pubescent beneath.....*V. fosteri*.
- la. Leaves glabrous or thinly pubescent or minutely tomentellous beneath.....*V. ferruginea*.

Additional citations: ZAIRE: *Becquaert* 17 (W--1659331); *Corbier-Baland* 1293 (Gz, Gz, N); *Lebrun* 1478 (W--2091172). TANZANIA: Tanga: *Malima* 19 (Id).

#### VITEX FISCHERI Gürke

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 317 & 330--331. 1900; H. N. & A. L. Mold., Pl. Life 2: 59. 1948; Dale, Descrip. List Introd. Trees Uganda 70. 1953; Snowden, Grass Comm. Mtn. Veg. Uganda 94. 1953; Dale & Greenway, Kenya Trees Shrubs 592 & 595. 1961; Langsdale-Br., Osmoston, & Wils., Veg. Uganda 115 & 118. 1964; Mold., Phytologia 15: 242--243. 1967; Gillett, Numb. Check-list Trees Kenya 47. 1970; Mold., Fifth

Summ. 1: 234, 238, & 242 (1971) and 2: 924. 1971; Mold., Phytologia 44 389. 1979.

Recent collectors describe this species as a tree, 20 feet tall, with a single stem, the bark rough, and the sap clear, and have encountered it in sandy soil of grassland, at 4000 feet altitude, fruiting in May. Tanner reports that the roots are "used for infertility in women and for pain below the ribs". He reports the vernacular name, "mhunda", in Tanzania. Gürke (1895) refers to the species as a tree or shrub with rather long-petiolate leaves and 5 lanceolate-oval glabrous leaflets. Dale & Greenway (1961) assert that it grows in wet savannas at 4000 to 6000 feet altitude in Kenya, where it is known as "mkhulu", "moholu", "mohutu", and "mufutumwe". Langsdale-Brown and his associates (1964) encountered it in undifferentiated semi-deciduous thickets and in *Albizzia-Chlorophora* forests in Uganda.

Baker (1900) cites Scott-Elliott 7252 & 7411 from Uganda and Fischer 476 and Stuhlmann 3394, 4137, & 4183 from Tanzania.

Additional citations: TANZANIA: Tanga: Shantz & Tanner 4235 (Tu--129104); Tanner R.T.4252 (Ba).

#### VITEX FLAVA Ridl.

Additional bibliography: Fedde & Schust., Justs Bot. Jahresber. 57 (2): 404. 1938; Mold., Phytologia 15: 243. 1967; Mold., Fifth Summ. 1: 328 (1971) and 2: 925. 1971.

This species is based on Haviland 2025 from "along the path to Tegora", Sarawak, collected on December 20, 1892. The collector speaks of the plant as a small tree with yellow corollas. Ridley (1929) notes that "This is most nearly allied to *V. longisepala* King, of the Malay Peninsula, but that is densely hairy all over, whereas this plant is almost completely glabrous with merely a little deciduous pubescence, the bracts are much smaller and the sepals and corolla are covered with yellow glands as is the ovary and the leaves on both sides".

#### VITEX FLAVENS H.B.K.

Additional & emended synonymy: *Vitex flavens* Kunth apud Spreng. in L., Syst. Veg., ed. 16, 2: 757. 1825. *Vitex flavens* Humb. & Kunth apud D. Dietr., Syn. Pl. 3: 612. 1843.

Additional bibliography: Spreng. in L., Syst. Veg., ed. 16, 2: 757. 1825; D. Dietr., Syn. Pl. 3: 612. 1843; Schau., Linnaea 20: 484. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 501. 1858; H. N. & A. L. Mold., Pl. Life 2: 80. 1948; Braga, Pl. Nordest., ed. 2, 338. 1960; Macbr., Fieldiana Bot. 13 (5): 692, 694, & 695. 1960; Mold., Phytologia 16: 499--500. 1968; Mold., Résumé Suppl. 16: 29. 1968; Mold., Fifth Summ. 1: 91, 120, 137, 144, & 179 (1971) and 2: 217, 727, & 925. 1971; Mold. in Woodson, Schery, & al., Ann. Mo. Bot. Gard. 60: 131, 135--136, & 148. 1973; López-Palacios, Revist. Fac. Farm. Univ. Andes 17: 50--51. 1976; Soukup, Biota 11: 20. 1976; Mold., Phytologia 44: 412. 1979.

Recent collectors describe this species as a tree or small tree, 5--26 m. tall, the trunk "1 cm. in diameter at breast height" [doubtless a very young tree or a typographical error for 1 dm.],

the bark gray, with many deep longitudinal furrows, and the leaves opposite and compound, and have found it growing in dry upland scrub and on "low semi-arid hills back of beach", at altitudes of sealevel to 466 m., flowering in December. The corollas are said to have been "purple" on *Dodson & Thien 1644* and these collectors report the vernacular name, "pechinche", from Ecuador.

Braga (1960) describes *V. flavens* as an "Árvore com fôlhas compostas, digitadas, de flores vistosas, em racemos, sendo o fruto uma pequena drupa, 4-locular. Boa madeira." He regards *V. pan-shiniana* Mold. as a synonym and calls the species "mama de cachorro".

López-Palacios, in a personal communication to me, says: "No he tenido oportunidad de examinar los tipos de *Vitex cymosa* Bert. y *Vitex flavens* HBK., pero el material que se les asigna en los herbarios es tan similar, que hace pensar que son coespecíficos o que el material ha sido mal interpretado. Téngase en cuenta esta observación para futuros trabajos en este género."

Macbride (1960) reports the wood of *V. flavens* used for construction, at least in Ecuador. He cites only *Tessmann 3247, 4492, & 4587* from Loreto, Peru, giving its overall distribution as "To Colombia and Amazonian Brazil".

Material of *V. flavens* has been misidentified and distributed in some herbaria as *Godmania* sp. and *Tabebuia* sp.

Additional citations: COLOMBIA: Huila: *Little 9137* (N). ECUADOR: Guayas: *Dodson & Thien 1644* (Ws, Z).

#### *VITEX FLORIBUNDA* Legris

Additional bibliography: Mold., *Phytologia* 15: 243 (1967) and 17: 10 & 21. 1968; Mold., *Fifth Summ.* 1: 279 (1971) and 2: 925. 1971.

#### *VITEX FLORIDULA* Duchass. & Walp.

Synonymy: *Vitex floridula* "Duchass. & Walp. ex Walp." apud Bultman & Southwell, *Biotropica* 8 (2): 79. 1976.

Additional bibliography: Mold., *Phytologia* 16: 500. 1968; Mold., *Résumé Suppl.* 16: 4. 1968; Gibson, *Fieldiana Bot.* 24 (9): 234. 1970; Mold., *Fifth Summ.* 1: 91 (1971) and 2: 925. 1971; Mold. in Woodson, Schery, & al., *Ann. Mo. Bot. Gard.* 60: 131, 135, & 148. 1973; Bultman & Southwell, *Biotropica* 8 (2): 79, 92, & 93. 1976; Mold., *Phytologia* 44: 409. 1979.

Illustrations: Pittier, *Contrib. U. S. Nat. Herb.* 18: 171. 1916.

Recent collectors describe this species as a tree, 20 m. tall, the trunk 12 inches in diameter at breast height, "mostly deciduous", and have found it in flower in April. They record for it the vernacular name, "cuajado", from the Panama Canal Zone. Gentry reports the young fruit eaten by the local inhabitants in Panama. The corollas are said to have been "purplish-blue" on *Gentry 4963*.

The *Seibert 1535*, distributed as *V. floridula*, actually is *V. parviflora* A. L. Juss.



Additional citations: PANAMA: Panamá: A. Gentry 4963 (N).

*VITEX FROESII* Mold.

Additional bibliography: H. N. & A. L. Mold., Pl. Life 2: 60. 1948; Mold., Phytologia 15: 243. 1967; Mold., Fifth Summ. 1: 179 (1971) and 2: 925. 1971.

*VITEX GABUNENSIS* Gürke

Additional & emended bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 317 & 327. 1900; Mold., Phytologia 15: 243. 1967; Mold., Fifth Summ. 1: 226 (1971) and 2: 925. 1971.

Baker (1900) cites only the type collection of this species, Soyaux 163, from Gabon.

*VITEX GAMOSEPALA* W. Griff.

Additional synonymy: *Vitex* nn. 15, 16 Hook. f. & Thoms. ex C. B. Clarke in Hook. f., Fl. Brit. India 4: 588, in syn. 1885. *Vitis gamosepala* Henderson ex Mold., Résumé Suppl. 3: 42, in syn. 1962. *Vitex gamopetala* Griff. ex Mold., Fifth Summ. 2: 717, in syn. 1971.

Additional & emended bibliography: W. Griff., Notul. Pl. Asiat. 4: 178 & 764. 1854; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1154. 1876; C. B. Clarke in Hook. f., Fl. Brit. India 4: 586 & 588. 1885; Fedde & Schust., Justs Bot. Jahresber. 39 (2): 320. 1913; Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 48. 1921; S. Moore, Journ. Bot. Lond. 63: Suppl. 81. 1925; Fedde & Schust., Justs Bot. Jahresber. 47 (2): 246 (1927) and 60 (2): 576. 1941; H. N. & A. L. Mold., Pl. Life 2: 67 & 82. 1948; Burkill, Dict. Econ. Prod. Malay Penins. 2: 2278. 1966; Mold., Phytologia 15: 243. 1967; Chan & Teo, Chem. Pharm. Bull. Tokyo 17: 1284--1286. 1969; Farnsworth, Pharmacog. Titles 5 (4): xii & item 4122 (1970) and 5, Cum. Gen. Ind. 1971; Mold., Fifth Summ. 1: 298, 306, & 328 (1971) and 2: 710, 717, 718, 723, 731, 732, & 925. 1971; Mold., Phytologia 23: 438 (1972), 34: 266 (1976), and 36: 38. 1977.

Recent collectors describe this species as a tree or small tree, 4--8 m. tall, or as a treelet, 3 m. tall, the branches pendent, the flowers asymmetric, the sepals yellow, and the fruits round, 3/4 inch in diameter, 1-seeded, green or red when immature, and have found it growing along trails in disturbed evergreen forests and in the transition zone between deciduous and evergreen forests, at altitudes from sealevel to 330 m., flowering in December, January, and April, fruiting in January, April, and July. The corollas are said to have been "yellow" on Larsen & Larsen 33421 and on Seesink & Santisuk 4960, while on Stone 8931 they are described as "outside covered with tiny round yellow glands, tube within violet with white hairs".

Bentham (1876) says of *V. gamosepala*: "insignis est calyce 3-fido, lobis rigidis erectis obtusis, 2 anticis tubo aequilongis, tertio postico duplo longiore; corolla normalis, fructus deest". Clarke (1885) says that "The corolla as well as the inflorescence shows the affinity to *V. vestita*". Burkill (1966) lists the ver-

naricular names, "lĕban nasi" and "lĕban pachat" [meaning, respectively, leech's lĕban and cooked-rice lĕban], "pelong" [probably an error for *Microstemon*], "sĕtulang" [in common with some other small trees, usually with hard wood], and "sulong chong", in Malaya. He describes the species as "A small tree found in Sumatra, the Malay Peninsula and Borneo; in the Peninsula it is apparently throughout. The vernacular names suggest that the wood is hard, but nothing precise is on record regarding it".

*Griffith 6065* is a cotype of Lam's var. *typica* and, indeed, may actually be the type collection of the species, although the original description by Griffith does not cite a number. It is cited by Clarke (1885) as *V. gamosepala* [p. 588] and as *V. coriacea* C. B. Clarke [now known as *Teijsmanniodendron coriaceum* (C. B. Clarke) Kosterm.] [on p. 586] -- perhaps the number represents a mixture. Clarke cites for *V. gamosepala* only *Griffith 6065* and *Maingay 1202* from Malacca.

In view of certain confusion regarding to the application of Griffith's name it may be of value to repeat his original description here: "Arbor. mediocris. Fol. trifoliata, foliolis lanceolatis acuminatis venatio apocyneoid. Cymis axillaribus foliis multo brevior. Cal. tubo brevi bilabiat. labio super majore integro inferiore bipartito extus. Cor. tubo anguste infundibulif. glandulosus calyce fere duplo longior, bilabiat., labio super. bifido erecto reflexo infer. 3-lobo, annulus pilorum ad medium tubi. Stam. 4 vix didynama, filam. subulatis robustis basi pubescent. Stylus longitud. stamin., stigma bifidum subaequal. Anth. biloculares narrow horse-shoe-shaped, filam. inserti in sinus. Cells not quite all along the inner margins of the curve, so that the anthers are mucronate at the base. See Fig. II. Pl. CCCCXLV-III. Cor. extus glandulosa, in aestivat. the upper lip is outermost, lower lip middle lobe innermost. Hab. Malacca at Ching Rhingull. Obs. The upper lip of the calyx which is glandular outside, is made up of 3, it often presents faint obsolete traces of composition, sometimes decided. The venation is too irregular to decide the point. In this respect it differs from *Vitex*, but not always unless indeed the anthers and stigma or fruit present corresponding differences."

It should be noted that the plate referred to in the above description in Griffith's "Notulae" (1854) and not appearing therein is undoubtedly the pl. 448, fig. 2, in his "Icones" of the same year. The former work is sometimes erroneously cited as having been published in "1851".

The *Boeea* 7155, 7184, 7245, 7532, 7784, 7821, 7971, & 8126, distributed as typical *V. gamosepala*, actually all represent var. *kunstleri* King & Gamble instead.

Additional & emended citations: THAILAND: *Larsen & Larsen* 33421 (Ac, Z), 34054 (Ac, Ld); *Seesink & Santisuk* 4960 (Ac). MALAYA: Malacca: *W. Griffith 6065*, in part (Mu--694--cotype, N--cotype, N--photo of cotype, Pd--cotype, S--cotype, Ut--11513--cotype, Z--cotype, Z--photo of cotype), *s.n.* [Malacca] (Mu--695--cotype, Pd--cotype). Selangor: *Hardial & Sidek* 400 (N); *B. C. Stone* 8931 (K1--20593).

*VITEX GAMOSEPALA* var. *KUNSTLERI* King & Gamble

Additional & emended bibliography: Fedde & Schust., Justs Bot. Jahresber. 39 (2): 320. 1913; S. Moore, Journ. Bot. Lond. 63: Suppl. 81. 1925; Fedde & Schust., Justs Bot. Jahresber. 53 (1): 1077. 1932; H. N. & A. L. Mold., Pl. Life 2: 67. 1948; Mold., Phytologia 15: 111. 1967; Mold., Fifth Summ. 1: 306 & 328 (1971) and 2: 710, 723, 731, 732, & 925. 1971; Mold., Phytologia 36: 38. 1977.

Recent collectors refer to this plant as a shrub, treelet, or small tree, 4--5 m. tall, the trunk 5 cm. in diameter, the branches pendent, the unripe fruit yellow or yellowish-green, and have found it growing in old jungles and in sandy soil on hillsides, at 80 m. altitude, flowering in March, fruiting in April and August. The corollas are said to have been "yellow" on Bartlett 6919.

The Moore reference (1925) in the bibliography above is sometimes cited as authored by Rendle or as "S. Moore in Rendle", but according to the table of contents in the volume in which it occurs, the entire paper was authored by Moore.

Almost all the collections cited below were originally distributed as typical *V. gamosepala* W. Griff.

Additional citations: MALAYA: Pahang: Balgooy 2468 (Ac, N). GREATER SUNDA ISLANDS: Sumatra: Bartlett 6919 (W--1551876); Boeea 7155 (W--1681733), 7184 (W--1682015), 7245 (W--1682040), 7532 (W--1682162), 7784 (W--1861613), 7821 (W--1861617), 7971 (W--1682320), 8126 (W--1682459); Forbes 2771 (W--2317943); Soepadmo 181 (Ca--1322018); Toroos 5599 (N).

*VITEX GAMOSEPALA* var. *SCORTECHINII* King & Gamble

Additional & emended bibliography: Fedde & Schust., Justs Bot. Jahresber. 39 (2): 320. 1913; S. Moore, Journ. Bot. Lond. 63: Suppl. 81. 1925; H. N. & A. L. Mold., Pl. Life 2: 82. 1948; Mold., Phytologia 15: 111. 1967; Mold., Fifth Summ. 1: 306 & 328 (1971) and 2: 717 & 925. 1971; Mold., Phytologia 34: 266. 1976.

Recent collectors describe this plant as a small tree, 6 m. tall, "with long rambling branches", the trunk 10 cm. in diameter, the bark grayish-white, the young leaves reddish, and the fruit black, and have encountered it growing at 100--1565 m. altitude, flowering in March and August, in fruit in September. The corollas are said to have been "yellow" or "yellow-green" on Soepadmo & Mahmud 1113 and "pure clear yellow" on Stone 9540.

The Moore (1925) reference in the bibliography, above, is sometimes cited as "Moore in Rendle" or even as having been authored by Rendle, but according to the table of contents of the volume in which it was published it was authored by Moore alone.

Additional citations: MALAYA: Kelantan: Soepadmo & Mahmud 1113 (Kl--16709); Stone 7332 (Kl--8494, Kl--15504). Selangor: Stone 9540 (Kl--15941).

*VITEX GARDNERIANA* Schau.

Additional synonymy: *Vitex gradneriana* Schau. ex Anon., Biol. Abstr. 51: 7701, sphalm. 1970.

Additional bibliography: Buek, Gen. Spec. Syn. Candoll. 3: 501.

1858; Peckolt, Bericht. Deutsch. Pharm. Gesel. 14: 480--481. 1904; H. N. & A. L. Mold., Pl. Life 2: 60. 1948; Braga, Pl. Nordest., ed. 2, 297. 1960; Mold., Phytologia 15: 243--244. 1967; Anon., Biol. Abstr. 51: 7701 (1970) and 51 (14): B.A.S.I.C. S.228. 1970; Barros, Matos, Vieira, Sousa, & Madeiros, Journ. Pharm. Pharmacol. 22: 116--122. 1970; Farnsworth, Pharmacog. Titles 5 (11): xviii & item 14903 (1970) and 5, Cumul. Gen. Ind. 1971; Mold., Fifth. Summ. 1: 179 (1971) and 2: 717, 718, & 925. 1971.

Peckolt (1904) says of this species: "In den Staaten Alagôas, Pernambuco und Rio de Janeiro corkommend. Volksnamen: Gerimato, Girimato, Jeramataia, Jeramataia miuda, korrumpierte Tubybenennungen. Die lanzettlichen Blätter des Strauches als Resolvens und gerühmt bei habituellem Verstopfung". Braga (1960) says: "Jaramataia....Árvore. Fôlhas opostas, digitadas, 3--5 folíolos obovais alongados, pubescentes. Flores pedunculadas, roxas, em pequenos cimos axilares densos. Drupa carnosa, 4-locular. Fôlhas calmantes, anti-reumáticas. Conhecida também por Tamanca e Tamanqueira." His statement that the leaves are 3--5-foliate is remarkable; all specimens seen by me have them merely 1-foliate and they are so described by Schauer in his original description. It is very probably that Braga's description is based on a misidentification.

Material of *V. gardneriana* has been misidentified and distributed in some herbaria as *Aegiphila* sp.

Additional citations: BRAZIL: Ceará: *Allemao* 1179 (P). State undetermined: *Clausen* s.n. (P).

#### *VITEX GAUMERI* Greenm.

Additional synonymy: *Vitis gaumeri* Greenm. ex Mold., Résumé Suppl. 16: 30, in syn. 1968. *Vitex gaumeri* Green ex Kribs, Comm. For. Woods, ed. 3, 161, sphalm. 1968

Additional & emended bibliography: Pittier, Contrib. U. S. Nat. Herb. 20: 483 & 486. 1922; Roys, Tulane Univ. Mid. Am. Res. Ser. Publ. 2: [Ethno-bot. Maya] 221, 257, 300, & 326. 1931; Yuncker, Field Mus. Publ. Bot. 9: 330. 1940; H. N. & A. L. Mold., Pl. Life 2: 60. 1948; Kribs, Comm. For. Woods, ed. 2, 161, fig. 473 (1959) and ed. 3, 161, fig. 473. 1968; Mold., Phytologia 16: 500 (1968) and 17: 28. 1968; Mold., Résumé Suppl. 16: 3, 13, & 30. 1968; Pennington & Sarukhán, Man. Ident. Arb. Trop. 370--371. 1968; Echinique-Manrique, 25 Maderas Trop. Mex. 191--198 & [234]. 1970; Gibson, Fieldiana Bot. 24 (9): 234--235, fig. 47. 1970; Mold., Fifth Summ. 1: 77, 81, 82, 84, & 374 (1971) and 2: 593, 717, 718, 726, 732, & 925. 1971; Mold., Phytologia 23: 416. 1972; Altschul, rugs Foods 246. 1973; Menninger, Color Sky 47. 1975; Molina R., Ceiba 19: 96. 1975; Mold., Phytologia 34: 252 (1976) and 44: 409. 1979.

Additional illustrations: Kribs, Comm. For. Woods, ed. 2, 161, fig. 473 (1959) and ed. 3, 161, fig. 473. 1968; Pennington & Sarukhán, Man. Ident. Arb. Trop. 370 & 371. 1968; Echinique-Menrique, 25 Maderas Trop. Mex. [197] & 198. 1970; Gibson, Fieldiana Bot. 24 (9): 235, fig. 47. 1970.

Recent collectors describe this species as a shrub or tree, 3--30 m. tall, the trunk 10--65 cm. in diameter at breast height;



bark gray, lightly fissured, sometimes scaly, the slash green under hard bark, the soft bark yellow, fibrous; wood cream-color, with a light astringent odor; branches ascending, tetragonal when young; leaves decussate-opposite, the leaflets dark-green above, gray or grayish-green beneath; flowers very fragrant, visited by many species of insects; the [immature] fruit green or dark-green, drupaceous, "axillary". They have encountered it in forests in general and more particularly in pine and open pine forests, both low and high forests, as well as in high evergreen forests with *Terminalia amazonia*, *Dialium guianense*, *Calophyllum brasiliense*, *Manilkara zapota*, *Swietenia macrophylla*, *Aspidosperma cruentus*, *Reedia macrantha*, *Nectandra* spp., and *Brosimum* spp. They have found it growing in thickets, along small streams in pastures, in secondgrowth, in low forests bordering lakes, in clearings and along the edges of rivers, in tintal, and along streams through *Byrsonima-Curatella* savannas, at 300--1100 m. altitude, flowering from May to August, and fruiting in January, May, June, and August to November.

The corollas are said to have been "blue" on Contreras 855, 2336, 5388, & 5658, Davidse & Pohl 2133, Dwyer 12598 & 12753, Matuda 3905, Molina R. 5459, Molina R. & Molina 25766, and Ortíz 1044, "bluish" on Contreras 9707, "bluish-purple" or "blue-purple" on Lundell 15887 and Lundell & Lundell 7321, "lilac" on Pennington & Sarukhán 9618, "violet" on Chavelas & al. 2980, and "lavender-blue, one lobe larger and darker blue" on Croat 23540.

Moreno speaks of "látex blanco", but as far as I know true latex is unknown in this genus. The Molinas describe the species as "common in river thickets" in Honduras; Shepherd refers to it as an "occasional canopy tree on mesic sites" in Campeche, Mexico. Pennington & Sarukhán say "Corteza lisa, finamente fisurado, pardo amarillento". Bequaert reports the leaves employed as a horse fodder. Roys (1931) says that *V. gaumeri* is "A tree 30 to 50 feet high.....It is very handsome and puts forth a blue flower from which bees gather honey [nectar]. The shade of this tree is very salubrious.....[it has] white wood....The Maya texts prescribe a decoction of the leaves as a bath to cure asthma....malaria...and chills. The crushed leaves are poulticed on ulcers and abscesses .....[the vernacular name] x-kom-yaxnic, applied to *Solanum amazonicum* Ker indicated a real or fancied resemblance to the yaxnic or *Vitex gaumeri*....*Ruellia tuberosa* L. is called x-cabal-yaxnic because its blossom resembles that of yaxnic or *Vitex gaumeri*."

Wood characteristics are given in detail by Echenique-Manrique (1970), while Kribs (1968) describes them as follows: "Color uniform light grayish brown or yellowish brown, or with darker zones which correspond with the growth zones. Luster medium. Odor and taste not distinct. Moderately hard and heavy, sp. gr. 0.64--0.72 (air dry); weight, 40 to 45 lbs. per cu. ft. Grain usually interlocked which produces a ribbon figure on the radial. Texture fine. Growth rings distinct and due to thicker walled fibers at end of ring. Vessels barely visible without lens on the cross section; evenly distributed, solitary and in radial groups of 2--3; tang. diam. 85u to 178u, av., 128u; lumina sometimes with tyloses; pits

alternate, small, diam. 4u--5u. Fibers libriform with medium thick walls. Parenchyma vasicentric 1--3 cells wide, occasionally short aliform, and diffuse. Rays visible without lens on the cross section; heterogeneous type III; multiseriates 2--5 cells wide, mostly 3--4 cells and up to 40 cells high; uniseriates scarce; vessel-ray pits round to oval, minute. Ripple marks absent. Gum ducts absent. Uses and source of supply agricultural implements and vehicles, sporting and athletic goods (polo stick heads, golf club heads, mallets, etc.); tool handles and cattle yokes. British Honduras, Honduras, Guatemala, and Mexico."

Yuncker (1940) describes the species as a "Tree about 15 meters tall and 35 cm. in diameter. Leaves palmately compound, the leaflets densely hairy beneath, entire; flowers small, deep blue, with pleasant odor, in panicle clusters. In open forests on semi-arid highland near the village of Las Flores, at 180 meters altitude" [in Atlántida, Honduras]. Gibson (1970) comments that "*V. gaumeri* is much like *V. hemsleyi* Briq. of Mexico, but differs in its much heavier indument and smaller flowers". The fruits are galled on Contreras 1639 & 6088.

Recent vernacular names reported for *V. gaumeri* include "crucillo", "dachnik" [=green ear], "fiddlewood", "jocote de mico", "nichté", "ya'axnik", "yashcabté", "y'ashnik", and "yaxnic".

Pennington & Sarukhán (1968) note that "Se encuentra restringida a la vertiente del Golfo desde el centro de Tab[asco] hasta la península de Yucatán, formando parte del estrato superior de Selvas medianas subperennifolias y subcaducifolias asociada con *Brosimum alicastrum*, *Manilkara zapota*, *Bursera simaruba*, *Astronium graveolens*, *Pouteria unilocularis*, etc. siempre a altitudes menores a los 500 m. y en suelos derivados de materiales calizos, someros y de buen drenaje superficial. Usos. En la actualidad do se usa su madera pues presenta inconvenientes tales como rajarse con relativa facilidad. Podría usarse en un futuro para fabricar parquet."

Gibson (1970) cites only Whitford & Stadtmiller 74.

Material of *V. gaumeri* has been misidentified and distributed in some herbaria as *V. pyramidata* B. L. Robinson and as *Godmania aesculifolia* (H.B.K.) Standl.

Additional citations: MEXICO: Campeche: Chavelas P. & Pérez J. ES.789 (Mi, Mi); Matuda 3905 (Ws); Pennington & Sarukhán K.9625 (N); Shepherd 50 (Mi, Ws). Chiapas: Chavelas P., Alanís, & Rosas ES.2980 (Mi); Pennington & Sarukhán K.9166 (N), K.9618 (N). Quintana Roo: Moreno 140 (N). Yucatán: Enriquez 493 (W--2597466); A. Gentry 535 (Ws), 538 (Ws); Lundell & Lundell 7321 (Au--192504, N, Ws). GUATEMALA: El Petén: Contreras 855 (Au--228053, Ld), 1639 (Ld--278540, Ld, Ld, W--2558710), 2336 (Au--228025, Ld, Ld), 2526 (Au--228020, Ld, N), 5388 (Au--254003, Ld, Ld), 5658 (N), 5836 (Au--254199, Ld, Ld, Mi), 6088 (Ld--278534, Ld, Ld, W--2558712), 9707 (Ld, Ld, W--2795352); C. L. Lundell 15887 (Ld, N), 15983 (Ld), 16079 (Ld); Ortíz 1044 (Ws), 1153 (N), 1259 (N). BELIZE: Croat 23540 (N); Dwyer 10834 (N), 12598 (Lc, N, W--2742191), 12753 (N); Dwyer & Liesner 12196a (W--2800216); Gentle 2528 (Tu--35170); A. Gentry 8267 (N), 8511 (N); Poole & Watson 1017 (Ld, Ld); Proctor

30250 (Ld). HONDURAS: Choluteca: Harmon & Fuentes 5987 (N, Ws); Hazlett 999 (E--2162966); A. Molina R. 5459 (W--2572523). Comayagua: Molina R. 8468 (Ld), 14304 (N). Copán: Hernández M. & Hernández R. 5197 (Z). El Paraíso: Davidse & Pohl 2133 (N); Molina R. 14482 (N, N). Morazán: Molina R. & Molina 25766 (N). Santa Bárbara: A. Molina R. 21980 (N).

*VITEX GEMINATA* H. H. W. Pearson

This taxon is now treated by me as *V. harveyana* f. *geminata* (H. H. W. Pearson) Mold., which see.

*VITEX GIGANTEA* H.B.K.

Additional & emended synonymy: *Vitex gigantea* Humb. apud Spreng. in L., Syst. Veg., ed. 16, 2: 756. 1825. *Vitex gigantea* Humb. & Kunth apud D. Dietr., Syn. Pl. 3: 611. 1843. *Vitex gigantea* Kunth apud Goyena, Pl. Nicarag. 1: 569. 1911. *Vitex gigantia* H.B.K. ex Mold., Phytologia 23: 438, in syn. 1972.

Additional & emended bibliography: Steud., Nom. Bot. Phan., ed. 1, 888. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 756. 1825; Sweet, Hort. Brit., ed. 2, 416. 1830; Loud., Hort. Brit., ed. 2, 551. 1832; Sweet, Hort. Brit., ed. 3, 551. 1839; D. Dietr., Syn. Pl. 3: 611. 1843; Schau. in A. DC., Prodr. 11: 688. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 501. 1858; Macbr., Field Mus. Publ. Bot. 13 (5): 692, 694, & 696. 1960; Acosta-Solis, Divis. Fitogeogr. Ecuad. 27, 57, 60, & 66. 1968; Mold., Phytologia 16: 500. 1968; Mold., Résumé Suppl. 16: 29. 1968; H. Weber in Fittkau, Illies, Klinge, Schwabe, & Sioli, Biogeogr. Ecol. S. Am. 2: [Van Oye, Monog. Biol. 19:] 488. 1968; Mold., Fifth Summ. 1: 137, 144, & 374 (1971) and 2: 717 & 925. 1971; Mold., Phytologia 23: 418 & 438. 1972; Molina R., Ceiba 19: 96. 1975; Zimmerm. & Ziegler in Zimmerm. & Milburn, Transp. Pl. 1 [Pirson & Zimmerm., Encycl. Pl. Physiol., ser. 2, 1]: 503. 1975; Mold., Phytologia 34: 257 & 270. 1976; Soukup, Biota 11: 20. 1976; Mold., Phytologia 36: 33 (1977) and 44: 412. 1979.

Recent collectors describe this species as a tree, 5--25 m. tall, the trunk to 30 cm. in diameter, the flowers with a slight perfume, and the fruit at first green, finally black, edible. They have encountered it in dense forests, dry tropical woods, and wet subtropical forests, from near sealevel to 1000 m. altitude, flowering from October to December, fruiting in January, February, and September. The corollas are said to have been "light bluish-violet" on *Asplund 18198* and "lilac" on *Mexia 6177*.

Vernacular names recently reported for the species are "giant chaste-tree", "moconto", "pechicha". and "pechiche". Macbride (1960) says of it: "Noted by authors as a beautiful tree with globose crown, the wood very hard; originally from Guayaquil. Obviously very closely related to *V. cymosa* Bert. and *V. flavens* HBK.; the Peruvian specimens with young leaves are sparsely pubescent above and Moldenke thinks it is not certain that they are the same species". He cites only *Mexia 6177* and *Tessmann 4723*. Vargas notes "frutas cápsulas [surely an error in observation!], su madera usado en ebanisteria y su fruto en dulces".

Mexia reports that during anthesis the tree is almost leafless, has "good hard wood". and is "common" in Loreto, Peru. Of his no. 4261 López-Palacios says: "en crecimiento y estéril". Loudon (1832) avers that it was introduced into cultivation in England from Ecuador in 1826. Molina (1975) lists it as cultivated in Honduras. Goyena (1911) describes rather well a plant which he calls *Vitex gigantea* as growing on the Grand Sabana in Nicaragua, but this seems most unlikely -- it is more likely that the plant which he saw was either *V. cooperi* Standl. or *V. kuylenii* Standl.

Macbride (1960) distinguishes the Peruvian species of *Vitex* known to him as follows:

1. Inflorescence usually a dm. long or longer and rather paniculate or dichotomous-cymose.
2. Calyx sub-bilabiate, nearly 5.5 mm. long; cymes supra-axillary.....*V. klugii*.
- 2a. Calyx 5-dentate or -lobate, 2--3 mm. long; cymes axillary or also terminal.
3. Peduncles about as long as or longer than the petioles....  
*V. compressa*.
- 3a. Peduncles much shorter than the petioles.
4. Leaflets 5; petioles often ampliate at apex...*V. cymosa*.
- 4a. Leaflets 3--7; petioles slender, not or little ampliate.....*V. pseudolea*.
- 1a. Inflorescence more or less simply cymose.
5. Cymes mostly 3-flowered; calyx tubular-funnelform, to 2 cm. long.....*V. triflora*.
- 5a. Cymes at least mostly or often many-flowered; calyx small.
6. Peduncles shorter than the petioles; calyx canescent.
7. Leaflets long-petiolulate; calyx in fruit lax, mucro-crenate.....*V. pseudolea*.
- 7a. Leaflets subsessile or short-petiolulate; fruit enclosed in the dentate fruiting calyx.....*V. gigantea*.
- 6a. Peduncles longer than the petioles.
8. Calyx gray, obsoletely dentate.....*V. orinocensis*.
- 8a. Calyx flavescent, obviously dentate.....*V. flavens*.

Acosta Solis (1968) cites Acosta Solis 6452, 13007, & 15821 from Ecuador.

Material of *V. gigantea* has been misidentified and distributed in some herbaria as *V. cymosa* Bert., *Tabebuia* sp., and *Bignoniaceae*.

Additional citations: ECUADOR: El Oro: Escobar 804 (Ld).

Guayas: A. Gentry 10034 (N). Morona Santiago: Little, Ortega U., Samaniego V., & Vivar C. 481 (Ld). Napo: López-Palacios 4261 (Ld). PERU: Loreto: Mexia 6177 (Au--122925, Ba). Tumbes: Vargas Alvarez 1 (N, Ws), 32 (N, Ws). CULTIVATED: Ecuador: Asplund 18198 (Ld, N, W--2652444).

#### *VITEX GIORGII* DeWild.

Additional bibliography: H. N. & A. L. Mold., Pl. Life 2: 61. 1948; Mold., Phytologia 15: 244. 1967; Mold., Fifth Summ. 1: 232 (1971) and 2: 925. 1971.

#### *VITEX GLABRATA* R. Br.

Additional & emended synonymy: *Vitex cunninghamii* Schau. apud C.



B. Clarke in Hook. f., Fl. Brit. India 4: 588, in syn. 1885. *Vitex leucoxydon* Schau. ex C. B. Clarke in Hook. f., Fl. Brit. India 4: 588, in syn. 1885 [not *V. leucoxydon* Blanco, 1895, nor L., 1829, nor L. f., 1791, nor Naves, 1918, nor Roth, 1956, nor Roxb., 1856, nor Wall., 1847, nor Willd., 1832]. *Vitex leucoxydon* F. I. ex Prain, Beng. Pl., imp. 1, 833, in syn. 1903. *Vitex glabratus* R. Br. ex K. Schum. & Lauterb., Nachtr. Fl. Deutsch. Südsee 370. 1905. *Vitex glabratus* K. Sch. ex K. Schum. & Lauterb., Nachtr. Fl. Deutsch. Südsee 370, in syn. 1905. *Vitex pentaphylla* Merr., Philip. Journ. Sci. Bot. 4: 320--321. 1909 [not *V. pentaphylla* Lamb., 1940, nor Pavon, 1940, nor Sessé & Moc., 1940]. *Vitex nitida* Merr., Philip. Journ. Sci. Bot. 7: 343--344. 1912. *Vitex leucoxydon* Kurz ex Troup, Silvicult. Indian Trees 2: 777, in syn. 1921.

Additional & emended bibliography: R. Br., Prodr. Fl. Nov. Holl., imp. 1, 512 (1810) and imp. 2, [Isis 1819:] 512. 1819; Blume, Bijdr. Fl. Ned. Ind. 14: 813. 1826; Wall., Numer. List [48], nos. 1749 & 1751. 1829; D. Dietr., Syn. Pl. 3: 611. 1843; Walp., Repert. Syst. Bot. 4: 86. 1845; Schau. in A. DC., Prodr. 11: 690--692 & 695. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 501 & 502. 1858; Benth. & Muell., Fl. Austral. 5: 31 & 68. 1870; R. Schomb., Fl. S. Austral. 52. 1875; Ceron, Cat. Pl. Herb. Manila 133. 1892; Prain, Beng. Pl., imp. 1, 832 & 833. 1903; K. Schum. & Lauterb., Nachtr. Fl. Deutsch. Südsee 362 & 369--370. 1905; Brandis, Indian Trees, imp. 1, 505. 1906; Fedde & Schust., Justs Bot. Jahresber. 40 (2): 336. 1915; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 113--114. 1917; H. Hallier, Meded. Rijks Herb. Leid. 37: 48 & 54. 1918; Kirtikar & Basu, Indian Med. Pl., ed. 1, 1936 & 1941--1942. 1918; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 49 & 50. 1921; Troup, Silvicult. Indian Trees 776 & 777. 1921; Gamble, Man. Indian Timb. 298 & 542. 1922; Haines, Bot. Bihar Orissa, ed. 1, 4: 711 & 713. 1922; Ridl., Fl. Malay Penins. 2: 634. 1923; Janssonius, Mikrogr. Holz. 4: 754, 758, 762--764, 767, & 824--827. 1926; Béjaud, Essenc. Forest. Camb. 348. 1928; Kanjilal, Das, Kanjilal, & De, Fl. Assam 3: 480, 485, & 561. 1939; Janssonius, Key Javan Woods 54. 1952; Petelot, Pl. Méd. Cambod. Laos Vietn. 2 [Archiv. Recherch. Agron. Past. Vietn. 18]: 248 (1953) and 4: 171, 225, 257, & 289. 1954; R. Br., Prodr. Fl. Nov. Holl., imp. 3, 512. 1960; Haines, Bot. Bihar Orissa, ed. 2, 2: 745 & 747--748. 1961; Prain, Beng. Pl., imp. 2, 2: 621, 622, & 1012. 1963; Backer & Bakh., Fl. Java 2: 604--605. 1965; Burkill, Dict. Econ. Prod. Malay Penins. 2: 2277--2279. 1966; Basak, Bull. Bot. Surv. India 10: 256. 1968; Hocking, Excerpt. Bot. A.13: 569. 1968; Mold., Phytologia 16: 500--502 (1968) and 17: 8, 10, 12, 13, 21, & 32. 1968; Mold., Résumé Suppl. 16: 9. 1968; Uphof, Dict. Econ. Pl., ed. 2, 545. 1968; Rao & Verma, Bull. Bot. Surv. India 11: 410. 1969; Sawyer & Chermisr., Nat. Hist. Bull. Siam Soc. 23: 126. 1969; Beard, West Austr. Pl., ed. 12, 113. 1970; Brandis, Indian Trees, imp. 2, 505. 1971; Long & Lakela, Fl. Trop. Fla. 739 & 961. 1971; Mold., Fifth Summ. 1: 269, 279, 284, 298, 303, 306, 318, 319, 328, 331, 333, 338, 349, & 374 (1971) and 2: 603, 714, 716, 718, 720--722, 724, 725, & 925.

1971; Rativanich & Dietrichs, Nat. Hist. Bull. Siam Soc. 24: 147. 1971; Mold., Phytologia 23: 413 & 438. 1972; Townsend, Kew Bull. 27: 148. 1972; Mold., Phytologia 28: 445. 1974; Kooiman, Act. Bot. Neerl. 24: 462. 1975; Long & Lakela, Fl. Trop. Fla., ed. 2, 739 & 961. 1976; Mold., Phytologia 34: 267. 1976; Fundter & Wisse, Meded. Landbowshogsch. Wagen. 77 (9): 205 & 206. 1977; Mold., Phytologia 44: 224 & 329. 1979.

Backer & Bakhuizen van den Brink (1965) describe this species as follows: Young branches densely short-hairy; leaflets 3--5, rarely 6, elliptic-oblong-obovate, acuminate, glabrous on the upper surface (excl. the large veins), pubescent beneath (especially in the primary vein-axils); median leaflet 11--31 cm. by 4--13 1/2 cm., on a 1--3 mm. long petiolule, the other leaflets smaller, on shorter petiolules; petioles 7--17 cm. long; corolla-tube villous inside (at and above the insertion of the stamens), without a ring of hairs near the base, 5--7 mm. long; corolla and calyx outside without glands; filaments villous on their lower halves, rather far exserted; corolla yellowish-white; median segment of lower lip blue-violet; cymes solitary, 7--22 cm. long (inclusive of the peduncles); pedicels 1/2 -- 5 mm. long; drupes (color?) 1 1/2 -- 2 1/2 cm. long. They assert that in Java it occurs in mixed forests, especially in humid localities, flowering there from July to December.

Troup (1921) says of *Vitex glabrata*: "A large deciduous tree with 5-foliate leaves. Bark smooth, white. Wood grey, moderately hard, close-grained, durable, of good quality, used for cart-wheels. Assam, Chittagong, Burma, Andamans; also in the Rajmahal hills, very local (Haines). This is a common and conspicuous tree in the upper mixed deciduous forests of Burma, and is also fairly common in certain types of lower mixed forests, preferring well-drained ground; it is a common companion of teak. Flowers, April-June; fruits, June-July. The fruit is a drupe about 0.5 in. long. Growth, according to Gamble, averaging 6 rings per inch of radius, giving a mean annual girth increment of 1.05 in." Janssonius (1926) describes the structure of the wood and its characters in great detail. The 5-foliolate form described by Troup, above, and other writers, is probably what I call f. *bombacifolia* (Wall.) Mold; true *V. glabrata*, as seen in Australia, is normally at least mostly 3-foliolate.

Basak (1968) reports the species from West Bengal on the basis of Basak 243, stating that it occurs also in Cachar, Assam, and Bihar, and that Prain (1903) records it from East Bengal and Chittagong [Bangladesh]. He claims that his record is the first from West Bengal [India].

Burkill (1966) says that *V. glabrata* is "found from north-eastern India to northern Australia; in the [Malayan] Peninsula it is unknown south of Penang. The timber is used for cart-wheels, and deserves attention for furniture and other purposes....It is moderately hard, tough, close-grained, and grey. Indian Forest officers have proposed the name Yoma wood for it, for marketing purposes. It is sometimes used in Java, and is highly valued in Celebes..... Mrs. Collins says that the fruit gathered quite ripe is eaten in Siam, and taste a little like dried prunes". Rativanich & Dietrichs

(1971) aver that in Thailand the bark is used as an astringent and to treat stomach disorders and diarrhea. Uphof (1968) reports that the "wood is much in demand by the natives [of the Malayan Archipelago] for the construction of houses, for boards and household utensils". Petelot (1953) tells us that "D'après Béjaud.... au Cambodge, l'écorce fait l'objet d'une exploitation intense. Le fruit et l'écorce entrent dans la composition de masticatoires". He claims that the species occurs throughout southern Indochina, as well as in India, Malaysia, and Australia.

Lam (1921) separates *V. nitida* Merr. [based on Klemme 19546 from Mindanao] from *V. glabrata* R. Br. as follows: in *V. nitida* the cymes are only in large terminal panicles, while in *V. glabrata* they are "axillary, also in the axils of the lower leaves, sometimes composed to a long, interrupted, leafy, terminal panicle". It would seem that this is not a tenable distinction, at least at the specific level, although a varietal or form status may be in order.

Most authors regard *V. bombacifolia* Wall. and *V. pallida* Wall. as identical to typical *V. glabrata*, but I regard them as probably worthy of at least form status and they are discussed hereinafter. Hallier (1918) cites for *V. glabrata* only Pierre 1838 from Cochinchina, Merrill 9330 from Palawan, and Forbes 3784 from Timor, but gives the species' overall distribution as Assam, Chittagong, Burma, Siam, Cochinchina, Kedah, Penang, Java, northeastern New Guinea, northern Australia, and Queensland.

Clarke (1885) gives the distribution of *V. glabrata* as "From S. Assam and Cachar to Malacca, frequent". He comments that "The typical *V. glabrata*, R. Br., has leaves usually 3-foliolate and rounder more glabrate leaflets and fewer-flowered corymbs than the Indian tree; but some of the examples of *V. Cunninghamii* appear identical with Silhet specimens". It should be noted that the name, *Vitex cunninghami*, was published on page 691, not "690" as stated by Clarke, in DeCandolle's Prodrômus, volume 11 (1847) and is there written with a single terminal "i".

It is also worth noting that Brown's original description (1810) is cited as "1827" by various authors, including Kanehira & Hatusima (1942), Lam (1924), Lam & Bakhuizen (1924), and in earlier installments of the present series by myself. This date is apparently erroneous.

Schumann (1905), in describing his *V. helogiton*, from New Guinea, notes that "Ich habe diese Pflanze früher mit *V. glabratus* R. Br. identifiziert; sie ist aber vor allem durch die Grösse der Blätter, ferner durch die Gestalt derselben und die Form der Blüten verschieden, wenn sie ich auch von den mir bekannten Arten am nächsten kommt". I am inclined to agree with him that *V. glabrata*, as currently treated in floras and manuals, includes several quite disparate elements, including the one he has described, probably worthy of at least varietal or form rank in addition to the ones hereinafter listed. Merrill's Philippine material may prove the same as Schumann's New Guinean form.

According to Bentham, *V. glabrata*, at least in Australia, has the petioles over 2 inches long, the petiolules 1/2 to 3/4 inch

long, and the flowers in loose, dichotomous, axillary cymes, while *V. acuminata* R. Br. has the petioles shorter than the leaflets, the petiolules very short or only to 1/4 inch long, and the flowers in thyrsoid panicles that are terminal or in the uppermost axils only.

Recent collectors have described this species as a shrub or low spreading to large tree, 6.5--20 m. tall, the canopy 8 m. wide, the bole to 8 m. tall, the trunk 23--66 cm. in diameter at breast height, to 90 cm. in girth, the bark hard, light-brown to gray, brownish-gray, or yellowish-gray, smooth or rough and flaky, finely and closely furrowed, peeling off in thin strips, the under bark brown, the inner bark straw-colored, the wood white or cream-color, the heartwood brown, the leaflets discolorous, light- or dark-green, shiny above, dull beneath, the stamens purple, and the fruit small, ovoid to more or less globular, shiny, light-green when young, purple or dark-purple to black when ripe, edible. They have found it growing in thickets, on foreshores, in evergreen or lowland rainforests, on sandy creekbanks, and in dry sclerophyll scrub, in sandy or lateritic soil, at 90--2000 m. altitude, flowering from April to July, as well as in October and November, and fruiting in June, July, September, and October.

The corollas are said to have been "white" on *Lazarides* 6975 and *Phusomsaeng* 238, "white with purple tinge" on *Specht* 1076 [and so described also by Beard (1970)], "white with purple hairs, base of upper petal-lobe yellow" on *Geesink & Santisuk* 4976, "creamy-purple" on *Katik NGF.37870*, and "pale-violet" on *Kostermans* 23907.

*Geesink & Santisuk* report the species "common at evergreen forest edge on hillslopes" in Thailand; *Kostermans* refers to it as "common" in Java; *Sawyer & Chermisrivathana* (1969) describe it as infrequent to common in Thailand; *Specht* found it in mixed open forests at the base of sandstone scarps in Australia. *Lazarides* avers that it "occurs on fringe of creek channels with *Eucalyptus camaldulensis* and *Arundinella nepalensis*", while *Wilson* encountered it "on sandstone hills, mainly outcrops, with low trees of *Owenia* sp. and *Terminalia* sp."

Vernacular names recently reported include "ashual", "bandikari", "bhodia", "bihbool", "cây den", "gentileng", "goda", "gohera", "horina", "kaping-asing", "khai-nao", "laban ketileng tileng", "langa-thang-thang", "ma", "pani-amora", "popoul ach sat", "popoul tuk", "serlung-baphang", and "xo con".

Color slides or photographs accompany at least some herbarium specimens of *Adams* 872, *Geesink & Santisuk* 4976, and *Lazarides* 6975.

*Schumann & Hollrung* (1889) cite only *Hollrung* 672 & 708 from New Guinea and *Schumann & Lauterbach* (1900) cite the same collection, describing the species as a tree 15 to 25 m. tall, with white, violet-veined corollas, "bisher aus Nordaustralien bekannt".

Material of *V. glabrata* has been misidentified and distributed in some herbaria as *V. acuminata* R. Br., *V. littoralis* Decne., and *V. quinata* (Lour.) F. N. Will. On the other hand, the *R. A. Perry* 1052, distributed as *V. glabrata*, is actually *V. acuminata* R. Br., while *Béjaud* 519 is *V. glabrata* var. *poilanei* Mold., *M. Ramos* s.n.



[Herb. Philip. Bur. Sci. 23485] and Sulit s.n. [Philipp Nat. Herb. 14407] are *V. quinata* (Lour.) F. N. Will. and Elmer 11602 and Kanehira 2022 are *V. quinata* var. *puberula* (H. J. Lam) Mold.

Additional citations: BANGLADESH: C. B. Clarke 20089 (Pd); King's Collector 407 (Mu--3800). BURMA: Upper Burma: Kingdon-Ward 22501 (Go). THAILAND: Geesink & Santisuk 4976 (Ac); Phusomsaeng 238 (Ac). PHILIPPINE ISLANDS: Culion: S. S. Ponce s.n. [Herb. Philip. Forest. Bur. 28904] (W--1262380). Luzon: Ahern 110 (W--445108). Mindanao: W. I. Hutchinson s.n. [Herb. Philip. Forest. Bur. 11245] (W--706282); D. P. Miranda s.n. [Herb. Philip. Forest. Bur. 20771] (W--1238733); Razon s.n. [Herb. Philip. Forest. Bur. 23671] (W--1293392); R. S. Williams 2949 (W--708173, W--708174). Mindoro: M. Ramos s.n. [Herb. Philip. Bur. Sci. 39371] (W--1376030). Palawan: E. D. Merrill 9330 (W--902574); Sulit s.n. [Philip. Nat. Herb. 12507] (W--2376198). MARIANA ISLANDS: Guam: Rodin 794 (W--1968684). GREATER SUNDA ISLANDS: Java: Koorders 10129<sup>p</sup> (Pd); Kostermans 23907 (Ac). LESSER SUNDA ISLANDS: Timor: Herb. Neth. Ind. For. Serv. BB.23954 (N). NEW GUINEA: Papua: Katik NGF.37970 (Mu, W--2740694). West Irian: Herb. Neth. Ind. For. Serv. BB.25755 (N). AUSTRALIA: Northern Territory: Adams 872 (Ai); Beens & Spence BS.30 (Ai--9851); Byrnes & Maconochie 1001 [Herb. North. Terr. 24004] (Ld); Cunningham 256 (N); Lazarides 6975 (Ai); Letts 60 (Ai--8346), 8348 (Ai); Specht 1076 (W--2125145); I. B. Wilson 180 (Ai).

*VITEX GLABRATA* f. *BOMBACIFOLIA* (Wall.) Mold., Phytologia 44: 329. 1979.

Additional & emended synonymy: *Vitex* nn. 10 and 18 Hook. f. & Thoms. ex C. B. Clarke in Hook. f., Fl. Brit. India 4: 588, in syn. 1885. *Vitex leucoxydon* Roth ex Mold., Phytologia 5: 382, in syn. 1956 [not *V. leucoxydon* Blanco, 1895, nor F. I., 1903, nor Kurz, 1921, nor L., 1829, nor L. f., 1781, nor Naves, 1918, nor Schau., 1893, nor Span., 1856, nor Wall., 1847, nor Willd., 1832].

Additional & emended bibliography: Voigt, Hort Suburb, Calc. 469. 1845; W. Griff., Notul. 4: 740 & 764. 1854; Buek, Gen. Spec. Syn. Candoll. 3: 501 & 502. 1858; K. Schum. & Hollr., Fl. Kais. Wilhelmisl. 121. 1889; Haines, Bot. Bihar Orissa, ed. 1, 4: 713. 1922; Petelot, Pl. Med. Cambod. Laos Vietn. 2: 248 (1954) and 4: 171. 1954; Haines, Bot. Bihar Orissa, ed. 2, 2: 747. 1961; Mold., Phytologia 16: 500--502 (1968) and 17: 8, 12, 13, & 21. 1968; Mold., Resume Suppl. 16: 9. 1968; Mold., Fifth Summ. 1: 269, 279, 284, 303, & 374 (1971) and 2: 714, 716, 720, 725, & 925. 1971; Mold., Phytologia 23: 438 (1972) and 44: 329. 1979.

This taxon is usually regarded as identical to typical *V. glabrata* R. Br., but as Clarke (1885) points out: "The typical *V. glabrata*....has leaves usually 3-foliolate and rounder more glabrate leaflets and fewer-fld. corymbs....The typical *V. bombacifolia*, Wallich (*Vitex* n. 18, Herb. Ind. Or. H. f. & T.),....has the leaflets mostly 5, large and broad". He also notes that "*V. pallida*, Wallich (*Vitex* n. 10, Herb. Ind. Or. H. f. & T.), has smaller, more hairy leaflets, and short peduncles".

[to be continued]